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VISCEROPTOSIS WITH SPECIAL REFERENCE TO PATHOGENESIS AND THE EXPLANATION OF SYMPTOMS.

by

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I N D E X.

VIII./

VISCEROPTOSIS WITH SPECIAL REFERENCE TO PATHOGENESIS AND THE EXPLANATION OF SYMPTOMS.

INTRODUCTION.

For some time past considerable attention has been directed to a condition characterized by dropping or downward displacement of the contents of the abdominal cavity accompanied either by irregular symptoms, neurasthenic or otherwise, or by none at all. The descent may be either general or partial, and the individual organs may be affected in different degrees. Of the thoracic viscera, the heart may be enlarged and ptosed in extreme cases.

The importance of the condition will be recognized from the fact that, on comparison of statistics from various sources, one can conclude that at least five per cent of all males, and twenty per cent of all females, including those who complain of no symptoms, are affected. Further, some degree of ptosis is present in about twenty-five per cent of all women suffering from disturbances of the gastro-intestinal tract and pelvic organs.

The first to describe visceroptosis, or splanchnoptosis as it is sometimes called, was probably Morgagni, while Virchow, in 1853, associated the mechanical/

mechanical effects of the prolapse with the starting-point of certain types of alimentary disorder.
In 1899, Glénard, who has given his name to the disease, elaborated our knowledge still further in his monograph "Les Ptoses Viscérales", in which he endeavoured to correlate post-mortem findings with clinical manifestations along the lines of modern research. Glénard called the condition 'enteroptosis', a word now confined to its literal meaning, that is, dropping of the intestines. Various other terms for the prolapse or descent of individual organs have been brought into use. Thus gastroptosis means displacement of the stomach; nephroptosis of the kidney; splenoptosis of the spleen; hepatoptosis of the liver, but A. Rose maintains that to ensure etymological accuracy we should employ gastroptosia, nephroptosia, etc.

Surgeons have from time to time performed laparotomy on cases provisionally diagnosed as chronic appendicitis or ovaritis, cholelithiasis, chronic gastric or duodenal ulcer, or even malignant disease, and found no such lesion. Often although the expected pathological condition has been demonstrated and treated 'secundum artem', no lasting benefit has accrued. Has some other factor, therefore, been at work in the production of symptoms? On going into the histories of these cases we very often find that associated/

associated with the abdominal trouble there have been headache, languor, apathy, a sallowness or duskiness of the skin, dyspnoea, palpitation or faintness on comparatively slight exertion, possibly slight pyrexia - all referred to by Sir Arbuthnot Lane as manifestations of the "auto-intoxication of chronic intestinal stasis."

The pathological conditions discovered at operation or in the post-mortem room have been frequently and variously described. Many years ago Glénard commented on the presence of certain angulations especially of the transverse colon, which he thought probably interfered with the normal passage of the intestinal contents. Lane himself has directed attention to various Kinks, some of which are undoubtedly identical with the above, and in particular to one which develops about two inches from the termination of the ileum - Lane's "ileal kink." Wilms has frequently noticed an excessively mobile and dilated caecum, Payr a characteristic membrane at the splenic flexure, Jackson a "thin vascular veil" passing from the right parietal wall to the anterior surface of the caecum and ascending colon. Toldt, Gray and others describe somewhat similar adhesions and bands on the left side of the pelvis in relation to the female internal organs of generation.

Walton/

Walton refers to the association of three distinct factors in visceroptosis, viz:- (1) general ptosis; (2) membrane and band formation; (3) general skeletal and muscular changes. All these lesions occur together, although it is disputed which is primary.

GENERAL ANATOMICAL CONSIDERATIONS.

Brief reference will here be made to the normal position of the abdominal and thoracic viscera from the standpoint of this thesis - a necessary preliminary to the discussion of morbid anatomy and pathogenesis.

The abdominal cavity consists of the abdomen proper which is situated above the brim of the true pelvis and the pelvic cavity which lies below it. The former is still further subdivided by four imaginary planes of section, viz:- (1) the subcostal, which passes horizontally between the most dependent parts of the tenth costal arches, (2) the inter-tubercular, parallel to the preceding, drawn through the tubercles on the iliac crest and the upper part of the fifth lumbar vertebra posteriorly, (3) and (4) two sagittal planes, right and left lateral, each corresponding on the surface to a perpendicular line from the mid-point between the symphysis pubis and the/

the anterior superior iliac spine.

By the horizontal planes the abdomen is mapped out into three districts or zones, which are termed from above downwards: (1) the costal, (2) the umbilical, and (3) the hypogastric. Each horizontal zone is in turn subdivided into three regions - the costal zone into the central epigastric and right and left hypochondriac; the umbilical into a central umbilical and right and left lumbar; and the hypogastric into a central hypogastric and right and left iliac.

The transpyloric plane, so named because the pylorus is normally situated on it, may be indicated on the surface by a line passing horizontally through a point mid-way between the umbilicus and the sterno-ensiform junction.

The stomach lies in the epigastrium and left hypochondrium, its cardiac orifice lying immediately below the diaphragm behind the seventh left costal cartilage one inch to the left of the median plane, its pyloric on the transpyloric plane half an inch to the right. The lesser curvature begins on the right side of the cardiac orifice, and runs downwards and to the right in a fairly uniform curve to end at the upper border of the pylorus. The greater curvature is much longer, and under normal conditions should commonly descend to about the level of the subcostal plane/

plane in the recumbent posture, or not lower than the umbilicus when the subject is erect.*

The lesser omentum suspends the lesser curvature from the liver. The greater curvature is connected to the diaphragm by the gastro-phrenic ligament and the spleen by the gastro-splenic, while the greater omentum passes in two layers from its most dependent part as far as the pelvis, doubles back on itself, and encloses the transverse colon.

The duodenum, ten inches long, differs from the rest of the small intestine in having no mesentery and in being directly attached to the posterior abdominal wall with the exception of its first inch. It turns abruptly forwards on the left side of the second lumbar vertebra to join the jejunum, forming the duodeno-jejunal flexure.

The jejunum, eight feet long, and the ileum, twelve feet long, form coils found in all parts of the abdomen below the liver and stomach and in the pelvis. They are freely movable as they possess a mesentery.

The caecum, with which the vermiform appendix is/

* No abdominal organ is absolutely fixed, each being capable of a greater or less degree of movement which may be influenced by such factors as (a) posture, (b) the amount of food and faeces in the alimentary tract, (c) the condition of the bladder, (d) movements associated with respiration and the circulation of the blood, and (e) pregnancy.

is connected, is a blind sac about two and a half inches long and three inches broad, which lies in the right iliac fossa, is entirely surrounded by peritoneum, but has no mesentery. It is directly continuous above with the ascending colon which is also normally a fixed organ.

The transverse colon, about twenty inches long, forms a U-shaped loop extending from the under surface of the right lobe of the liver in the right hypochondriac region to the lower extremity of the spleen in the corresponding region on the other side. The lowest part of the curve usually follows closely the greater curvature of the stomach. By virtue of its mesentery, the transverse mesocolon, which suspends it from the posterior abdominal wall, the viscus may alter its position from time to time falling even as low as the pubic symphysis without a diagnosis of visceroptosis being justifiable.

The splenic flexure is usually at a slightly higher level than the hepatic.

The descending and iliac colons are devoid of peritoneum except posteriorly, but the pelvic colon on the other hand is surrounded by peritoneum and suspended by the pelvic mesocolon. This last portion of the large intestine varies very considerably in length, and lies in relationship to coils of small intestine above and the bladder or uterus and bladder/

bladder below.

The peritoneal attachments of the rectum do not require consideration in this monograph.

The liver is the largest gland in the body and occupies a very large part of the upper portion of the abdominal cavity where it lies in the epigastric and both hypochondriac regions. Dependent upon its association with the dome of the diaphragm it is greatly influenced by the respiratory movements. Only two borders need concern us here. During quiet respiration the upper border of the anterior surface roughly corresponds to a line drawn from a point on the left lateral plane at the level of the sixth rib to one on the corresponding rib on the opposite side, midway between the right border of the body and the right lateral plane. The inferior border coincides below with the costal margin from which it passes obliquely upwards and to the left to end where the upper border began.*

The spleen lies very deeply behind the stomach in the left hypochondrium and the adjoining part of the/

* In infants this border extends half an inch below the costal margin, a difference from the adults depending to a large extent upon the greater relative size of the organ.

the epigastrium. Much of its surface is in contact with the diaphragm. With the exception of a small strip at the hilum it has a very firm peritoneal investment, and is attached to the left kidney and the fundus of the stomach by the lieno-renal and gastro-splenic ligaments respectively.

The pancreas is situated almost entirely retro-peritoneally and is practically fixed in position.

The kidneys lie on the upper part of the posterior wall of the abdomen - one on either side of the vertebral column opposite the bodies of the last thoracic and upper three lumbar vertebrae. For the most part they occupy the epigastric and hypochondriac regions, that of the right side usually extending slightly into the lumbar and umbilical regions, that of the left being somewhat higher and rarely crossing the sub-costal plane. Both kidneys are enclosed in a condensation of retro-peritoneal fascia which sometimes extends downwards below the lower pole of the organ and must be considered a predisposing cause of nephroptosis.

The uterus lies between the bladder and rectum and projects forwards and upwards into the peritoneal pelvic cavity. Its long axis meets that of the vagina at a right angle in the normal position of anteversion. In addition, the body of the uterus is/

is more pliant than the cervix and forms an angle with it, open forwards, so that the normal uterus is not only anteverted but also anteflexed.

As the heart is sometimes affected in viscero-ptosis, it should be remembered that its apex is normally situated in the fifth left intercostal space, three and a half inches from the median plane, and that its upper margin, formed by the atria and auricles, extends from below the second left cartilage, one inch from the sternum, to the upper border of the third right cartilage, half an inch from the sternum.

THE FACTORS BY WHICH THE PROPER POSITION OF THE ABDOMINAL VISCERA IS MAINTAINED.

Normally the abdominal contents are maintained in position by a number of different forces, four most commonly cited being (1) ligamentous, vascular, and peritoneal connections, (2) atmospheric pressure, incorporating the negative pressure of the thoracic cavity acting through the diaphragm, (3) gravity, with which is associated the pressure of other abdominal organs, and (4) intra-abdominal pressure maintained by the tonicity and supporting power of the abdominal muscles. There has been considerable dispute as to the/

the relative importance of these factors, and consequently from time to time we have had diverse views regarding the pathogenesis of visceroptosis.

Ligaments with which are included omenta and mesenteries are folds of peritoneum containing vessels and connective tissue which naturally go to strengthen them. That they play but little part in the support of the abdominal contents is easily shown by stripping off the muscular parietes of a cadaver, when, unless there has been extensive band formation from old-standing peritonitis, the viscera drop at once into a position of extreme ptosis.

That ligamentous attachments cannot be of much importance is further obvious when one considers the extreme mobility of the organs in the upper part of the abdomen with the respiratory movements. It is clear that if much of the weight of any viscus was thrown on its mesentery, the various blood-vessels and nerves which run in it would inevitably stretch with consequent interference with their function, a condition which is never found in health, but only in cases of visceroptosis where other factors have apparently been at work.

Atmospheric pressure may likewise be ruled out of account, for, when a cadaver is lifted up the liver falls at once, the epigastrium forthwith sinking in/

in to occupy the space just vacated. This simple experiment proves conclusively that the liver is not held in position by the force of 15 lbs. to the square inch exerted by the atmosphere.

The third factor under consideration, gravity, is universal in its action. Dependent upon it are the pressure and counter-pressure exerted by individual organs upon each other, which must be of considerable importance in maintaining each in its own particular part of the abdominal cavity. Take for instance the kidneys. Upon the upper part of the anterior surface of the left kidney are placed the stomach, spleen, pancreas, and suprarenal gland which exert a downward and backward pressure counteracted by the intestinal canal, that, as a rule, presses upwards and backwards. Resting upon the upper inclined plane of the right kidney is the liver, which conveys a slight influence in a downward direction from the diaphragm, and which is resisted by the upward and backward pressure of the colon. There is no doubt that the left kidney is more influenced by these forces of pressure and counter-pressure than the right as the latter is embedded to a greater or less extent in the liver, a state of affairs which no doubt goes a long way towards fixing the organ in position. The condensation of extra-peritoneal tissue at the poles/

poles of the kidneys is of secondary importance.

Lastly, all are agreed on the importance of the supporting power of the abdominal muscles, the cross-wise arrangement of fibres in the different layers suggesting at once such a function. Groddeck of Baden-Baden laid stress on muscular tonus and contraction as primarily responsible for the maintenance of intra-abdominal tension or pressure. Not only does this force support the viscera on each other and on the shelf formed by the psoas muscles and the curve of the lumbar vertebrae, but it also has to do with the regulation of the flow of blood and lymph, so essential to the health and vigour of the digestive apparatus. Its proper working, according to the studies of Sherrington and Keith, depends on the integrity of the reflex arc, the afferent end-organs of which are the Pacinian bodies and peritoneal nerves. I have already referred to the ptosis which occurs when a cadaver is placed in the erect position, but during life the abdominal musculature comes into action with every change of posture. The muscles chiefly concerned are the transversales and the external and internal obliques; the recti have more to do with the movements of the body than with the support of the viscera, while the action of the diaphragm is variable, working with gravity when the subject is erect, against it when he is supine.

PATHOLOGICAL CHANGES WITH THE ONSET OF VISCEROPTOSIS.

In this section one is concerned with alterations in the shape, position, and fixation of the viscera. The three factors referred to in the introduction will be discussed in turn, viz.- (1) General ptosis; (2) Membrane and band formation; (3) General skeletal and muscular changes.

Gastroptosis or prolapse of the stomach rarely exists without downward dislocation of other abdominal organs. Rovsing and Duret, whose work has been confirmed by Hurst and Jordan, have shown that the greater curvature may reach to below the pubis, while the lesser may be at the level of the umbilicus. The prolapse is chiefly along the line of the lesser curvature, where there is considerable stretching and lengthening of the ligaments and mesentery. The stomach is commonly U-shaped with a sharp kink about its middle, which has been said to predispose to gastric ulcer. The pylorus itself is often near the level of the umbilicus and is frequently kinked; rarely in extreme cases of "vertical stomach" it lies on the left side of the hypogastric region.

Gastroptosis is to be distinguished from gastrectasis or dilatation of the stomach, although the two conditions are almost invariably associated.

Dilatation/

Dilatation involves an increase in the distance between the upper and lower borders of the stomach, whereas in gastroptosis per se this distance is increased but little, if at all. The dilatation in gastroptosis is often accompanied by irregular and spasmodic peristalsis.

The duodenum is abnormally mobile especially in its first part, which is less firmly bound down by peritoneum than the remainder, and more easily dragged upon by the ptosed stomach. Kellogg has shown that, like the stomach, this organ is very frequently dilated, while Jordan lays stress upon the associated general interference with peristalsis. Hypertrophy of the muscular coat may occur secondarily.

The coils of the jejunum and ileum are at a lower level than usual, the root of the mesentery also prolapsing from one to two inches. Kemp comments on the degree to which the small intestine may descend without there being any appreciable interference with peristalsis.

The whole of the colon becomes lengthened and atonic, the caecum tending to be displaced downwards and medially over the pelvic brim. The attachments of this sac may become so loose that the gut may be capable of being withdrawn from the abdominal cavity, and/

and this in even greater measure is true of the dilated ascending colon. The portion of the large intestine, however, which is most affected is the transverse part, which tends to sag downwards, forming a greatly lengthened loop reaching even into the pelvis, although from the great normal range of movement of the viscus a diagnosis of coloptosis cannot be made from this alone. The angles which it forms at the hepatic and splenic flexures become more acute, but the flexures themselves by virtue of their firm peritoneal attachments, do not prolapse to any great extent. As a rule the descending colon is only slightly affected, but the loosely anchored pelvic colon lengthens and dilates.

With regard to the solid viscera, descent of the liver is uncommon owing to the rigidity of its attachments and the protection afforded by the ribs. When it does occur, not only does the organ prolapse but it also tends to rotate to the right, its anterior inferior edge at the same time moving backwards. Occasionally the part projecting below the costal margin is separated from the rest by a very definite constriction, and then comes to be known as Riedel's lobe.

The passage of bile along the bile-ducts is interfered/

interfered with to some extent by the backward rotation of the liver, which brings the gall-bladder from its normal angle of forty-five degrees into the vertical position. The traction of the prolapsed stomach and duodenum is probably another factor in the production of biliary stasis.

Movable spleen, although uncommon, is a well-recognised condition occurring usually in association with complete visceroptosis. In an extreme grade it may come to occupy any region of the abdomen, and may even be mistaken for a tumour arising in the pelvis. The gastro-splenic and lieno-renal ligaments become stretched and lax, the latter sometimes even twisted with consequent kinking of the splenic vein and all the symptoms of an ovarian cyst with twisted pedicle.

Slight descent of the pancreas occasionally occurs.

Nephroptosis or displacement of the kidney is one of the most frequent phenomena in visceroptosis. Usually fixed, under certain circumstances one or other organ, especially the right, or more rarely both, becomes prolapsed and mobile. The fact that the right kidney is more frequently affected has been ascribed mainly to its more intimate relationship with the liver, an organ which ascends and descends freely with respiration.

The/

The term "movable kidney" has been used for all degrees, but it is well perhaps to distinguish between the following:-

(1) palpable kidney, the lower pole of which one can just palpate on deep inspiration;

(2) movable kidney, which on inspiration descends so that one's fingers can easily slip over the upper pole and hold it down;

(3) floating kidney, where the organ is easily found on abdominal examination and readily moved to the middle line or down into the pelvis.

All these conditions are associated with absorption of the peri-renal fatty capsule and a general relaxation of the peritoneum which passes anteriorly; the formation of a true meso-nephron is extremely rare.

It must of course be remembered here, as in the case of other organs under discussion, that degenerative and inflammatory changes are frequently superimposed.

As regards the uterus, not only may it be prolapsed but also retroverted, changes due to some extent to loss of fat and wasting muscle fibre. In many cases relaxation of the broad ligament or even descent of the pelvic floor occurs in association with the uterine or ovarian descent.

The heart is only displaced in extreme cases when/

when there are marked skeletal alterations, and is then frequently dilated and conical.

The aorta may also dilate with degeneration of its coats, while some degree of arterio-sclerosis is an almost constant finding in the smaller blood-vessels.

According to Lerch, the thymus may be enlarged and over-distended.

The diaphragm often tends to assume the position of maximum inspiration, moving slightly or not at all with the respiratory movements which become mainly thoracic.

One passes now to the second factor on which stress is laid by modern investigators, viz. membrane and band formation.

According to Lane these bands and adhesions come into existence from below upwards, the first to be formed being in relation to the surface of the mesentery of the pelvic colon, running parallel to the bowel and connecting it to the brim of the true pelvis*. Others are formed at successively higher and higher levels.

The splenic flexure is naturally well supported by the costo-colic ligament which tends to become thickened. In addition to this, however, we have the development/

* The left ovary may be involved and rendered cystic.

development of a special structure known as Payr's membrane, which is thin and transparent and contains long parallel blood-vessels, and binds the gut to the hilum of the spleen.

Jackson's membrane is similar but more extensive, and passes between the right parietal wall and the anterior surface of the caecum and ascending colon. Occasionally it extends upwards to the region of the hepatic flexure where it forms a hepato-colic fold between the bowel and the liver. Although Jackson's membrane moves freely over the surface of the intestine, a portion of it may lead to kinking by approximating the hepatic flexure to the caecum. Adhesions may also occur between this flexure and the right kidney.

Passing between the right iliac fossa and the under surface of the mesentery, or in well-marked cases reaching even to the bowel within two to three inches of the ileo-caecal valve, is the important membrane which causes Lane's ileal kink. This membrane is placed more or less at right angles to the long axis of the bowel, not parallel to it as in the case of the fibrous band in association with the pelvic colon. Other adhesions developed in this region may anchor the vermiform process.

Pringle has described a 'meso-colic band' which unites the first few inches of the jejunum to the under/

under surface of the transverse meso-colon, while others have indicated another special fold, the 'cystico-duodenal', binding the pylorus and duodenum to the liver in front of the transverse fissure, and extending along the cystic duct to the gall-bladder. This fold is really a thickened continuation of the lesser omentum.

Kinks may form at any of the following situations:-

(1) in the pelvic colon in consequence of the first of the adhesions described above - 'Lane's first and last kink;"

(2) at the splenic flexure by virtue of the pull of the thickened coats, colic ligament and Payr's membrane on the one hand, and the sagging of the loaded and atonic transverse colon on the other;

(3) at the hepatic flexure which may be bound down by the hepato-colic fold, and by adhesions to the right kidney;

(4) in the ascending colon as a result of the pull on the hepatic flexure and on the caecum by the free margins of Jackson's membrane;

(5) at the appendix through the involvement of the tip in an adhesion which contracts and doubles the distal portion of the organ upon the proximal;

(6) at the termination of the ileum due to the prolapse of the caecum into the pelvis while the small intestine is held up by the band recently described in association with the under surface of the mesentery.

(7) just beyond the duodeno-jejunal flexure through the fixation of the gut by Pringle's meso-colic band and the dropping of the freely mobile jejunum just distal to it;

(8) at the pylorus through the anchoring of the bowel by the cystico-duodenal ligament which causes delay in the emptying of the stomach and consequent sagging; and

(9) in the stomach itself on the lesser curvature.

Rovsing and Lane have remarked upon the extreme frequency of gastric and duodenal ulcer in the subjects of visceroptosis. The gastric contents are retained and may become most acid and irritating from the continued hyper-secretion, so that ultimately one gets congestion and ulceration at the points of kinking on the lesser curvature and at the pylorus. Hence these observers endeavour to explain the frequency of hour-glass contraction and of pyloric obstruction in women who possess the 'ptosis habitus.'

Walton and others do not share these views and point out that while visceroptosis is commoner in women, chronic gastric and duodenal ulcers have their greatest frequency in men. Moreover, of Walton's series of two hundred and seventy-three cases of gastric and duodenal ulcer which came up for operation, only/

only nine showed evidence of a ptosis which gave rise to symptoms, while only forty-seven showed some evidence of symptomless visceroptosis. The remaining two hundred and seventeen were quite uncomplicated.

Lane holds that involvement of the appendix and adhesions is a common preliminary to appendicitis, while mucous colitis and carcinoma of the bowel are explained by the irritation of the intestinal contents at the points of kinking. His theories on intestinal stasis will come up for discussion later.

It has been demonstrated that following on extensive adhesion formation from tuberculous or malignant peritonitis, little interference with the passage of intestinal contents may ensue. Moreover, radiographically, in cases of visceroptosis, one can demonstrate the passage of the barium meal past quite sharp kinks. Is too much stress being laid on kinking, therefore? There is a muscular sphincter at the ileocaecal valve, which might produce a semblance of narrowing from adhesions, and Sir Arthur Keith has described others at sites corresponding fairly loosely to those of Lane's kinks. It may be that when stasis occurs Keith's intestinal motors are at fault in the first instance, but unfortunately our knowledge on this matter is still far from complete.

The/

The general skeletal and muscular changes which occur sooner or later in every case are the third point in this discussion of pathology. Two types have been differentiated by Goldthwait, Rovsing, and Smith - the virginal and the maternal. The virginal type was formerly referred to as the constitutional or congenital, the maternal as the acquired.

The former is an expression of an anomaly of development, the subjects usually being thin, poorly developed, and often exceptionally tall for their years especially during childhood. The thorax is unusually long and shallow with oblique ribs and a narrow epigastric angle, a condition which will lead to downward displacement of the diaphragm and liver. Mobility of the tenth ribs (the stigmata neurasthenicorum) as described by Stiller is sometimes present, but is of no diagnostic significance. The abdomen is protuberant, the lumbar curve diminished, the carriage stooping, and the general musculature poor, while according to Hess and Eppinger vagotonia is invariably present along with the constitutional inferiority.

All these changes are usually referred to as the 'ptosis habitus' or the 'habitus enteropticus.' The fully-developed picture does not as a rule manifest itself/

itself till after an acute illness during childhood, especially one accompanied by considerable muscular wasting, although there is usually a hereditary predisposition and a neurasthenic diathesis.

In its pure form the maternal type occurs in women who have previously been strong and healthy with no 'ptosis habitus'. The name strictly implies only displacements following on frequent pregnancies, especially where these have been associated with large peritoneal tears or insufficient rest after parturition. It has, however, of late been given a wider significance by some authorities to include those cases following upon such mechanical causes as the tapping of ascites, the removal of large abdominal tumours, tight lacing, and the lifting of heavy weights.

The essential change is either an atrophy and loss of tone of the abdominal muscles, and especially of the transversales and external and internal obliques, or a separation of the recti. The abdomen becomes prominent below the level of the umbilicus, while at a later stage one may get some of the skeletal changes found in the congenital form such as loss of the lumbar curve, rounding of the shoulders, and lengthening and flattening of the chest; frequently there is marked loss of weight.

Virginal/

Virginal and maternal visceroptosis blend imperceptibly into each other, the most marked cases of the condition being those with a congenital 'ptosis habitus', and an acquired atrophy of the abdominal musculature from some of the above-mentioned mechanical causes.

ETIOLOGY AND PATHOGENESIS.

Sex. Visceroptosis is much more common in women than in men, as the following figures from Einhorn show.

Patients examined.	Percentage with Visceroptosis.
Males	6.2
Females	34.8
Both sexes	17.6

Other authorities give different percentages but, as already stated, one can conclude that at least twenty per cent of all women and five per cent of all men, including those who complain of no symptoms, are affected. Moreover, twenty to twenty-five per cent of women with digestive or uterine disturbances have at least some degree of displacement, most commonly movable kidney or enteroptosis.

Age./

Age. The condition is rare in children below the age of twelve. The greatest number of cases is from eighteen to forty, although the most extreme occur even later, between fifty and sixty.

Numerous, diverse, and in many respects contradicting theories have been propounded to explain the pathogenesis of visceroptosis. To make these clear certain of the facts already enunciated will have to be re-considered from a slightly different stand-point.

The support of the viscera, as was indicated in an early section, is dependent upon the maintenance of intra-abdominal pressure by the parietal muscles, and to a much less extent upon the functions and action of ligaments, the presence of adipose tissue, and the curve of a lumbar vertebrae. As a corollary to this, prolapse will occur from interference with any one of these factors.

In the virginal type of cases the abdominal muscles act at a disadvantage as the upper abdominal opening is narrow, the epigastric angle diminished, and the waist small. Further, the lumbar curve on which the viscera are supported is diminished. The adoption of the erect posture has probably a subsidiary effect in the causation of the condition, while with the onset of an acute illness there is a substantial reduction in intra-abdominal pressure by wasting/

wasting of muscle substance and loss of extra-peritoneal fat.

Congenital weakness of the supporting ligaments (Glénard) may be postulated as a cause in some cases, while according to Lerch the large, overdistended thymus has a bearing on the disturbances of the nervous and circulatory systems.

The extraordinary difference in sex incidence is due to the fact that boys as a rule take much more exercise than girls, so that their muscular and osseous symptoms are more highly developed and less readily affected by illness and other adverse influences.

The maternal type of visceroptosis is largely the result of the stretching of muscles and relaxation of ligaments in later life from frequent pregnancies, large abdominal tumours, or ascites. Emaciation, insufficient rest in the puerperium, lack of exercise, constipation, and the lifting of heavy weights also play a part in many instances.

Emaciation has been mentioned, but obesity often seems partly to be responsible, especially in multi-parae when the anterior abdominal wall is pendulous and flabby. Further, in multiparae injuries to the pelvic floor and acute illnesses or chronic wasting diseases are etiological factors of prime importance.

In both varieties skeletal deformities such as occur/

occur in spinal curvature and rickets are contributory. So is compression of the thorax by wrongly-constructed corsets or tight waist-bands.

The nature and formation of bands and membranes must be considered in great detail in view of the researches of Lane and his co-workers. Do they or do they not play any part in the production of viscero-ptosis and in particular of symptoms? Three theories have been advanced to explain their existence, viz:-

(1) that they are dependent upon chronic inflammation.
(2) that they are the result of chronic intestinal stasis, and
(3) that they are of congenital origin.

(1) That they are inflammatory in origin.

Jackson believed that the membrane to which he gave his name was dependent on chronic inflammation, and was simply the separated peritoneal coat, the result of an exudate of lymph. Binnie, Gerster, Hertzler, Hofmeister, and Adami supported this view and extended it in its application so as to include the adhesions and bands described by other authorities. Against this theory are (1) the fact that the membranes do not in the least resemble in their texture the fibrous structures seen in peritonitis, pleurisy, and other inflammatory conditions, (2) that they may be present/

present in the foetus, and (3) that had they been inflammatory one would have expected their formation on the mesenteric and not on the avascular side of the gut.

(2) That they are a sequel to chronic intestinal stasis.

This theory has been advocated by Sir Arbuthnot Lane in his book on 'Chronic Intestinal Stasis'. This authority holds that so long as the abdominal muscles are in good condition the assumption of the erect posture does not, as one might imagine, lead to stasis in the bowel. In fact what happens is that during the day the abdominal viscera tend to sink downwards and backwards into the pelvis, but this is counter-balanced at night by the recumbent posture tending to return them upwards and backwards into the abdomen. The tonicity and contraction of the parietal muscles and the peristalsis of the intestines all play a part so that free drainage is secured day and night.

When things go wrong, however, there are numerous factors of importance in the production of an unhealthy alimentary tract. Thus Lane lays stress upon the faulty position adopted by civilized races during defaecation, defective training with regard to the efficient and daily discharge of faecal matter, the wearing/

wearing of tight-fitting corsets, and the weakening of abdominal muscles by frequent pregnancies and from the lifting of heavy weights.

Faecal accumulation must lead to a sagging of the intestine. This tendency to ptosis is resisted by "crystallization of lines of force upon the surface of the peritoneum along which strain is specially exerted" (Lane). These conservative adhesions cause kinking or angulation of the gut in the locations described. Stasis is thereby increased, and with it we get delayed digestion, constipation, and auto-intoxication.

Gastric and duodenal ulcers often occur at points of kinking, adhesions round the appendix may lead to appendicitis, while pancreatitis and cholecystitis may result from the invasion of the pancreatic and bile-ducts by the micro-organisms normally confined to the lumen of the bowel. Mucous colitis and carcinoma of the intestines may sometimes be explained by the irritation of the faecal matter at the points of kinking.

Auto-intoxication often gives rise to sleeplessness, headache, neuralgia, and rheumatic pains, while the lowered general resistance definitely predisposes to tuberculosis, rheumatic fever, rheumatoid arthritis, pyorrhoea alveolaris, and chronic mastitis. In fact there/

there are few general or constitutional diseases which have not at some time or other been regarded as remote manifestations of intestinal stasis, and certainly the vast majority improve to some extent under treatment directed solely to the eradication of intestinal toxaemia. Of recent years certain "border-land" insanities as mild melancholia and epilepsy have been greatly benefitted, if not altogether cured, by colon lavage alone.

Lane's conclusions are not universally accepted for the following reasons:-

(a) Although Jordan was able to demonstrate delay in the passage of intestinal contents in association with Lane's kinks, Cannon found that peristalsis was sometimes able to drive the food and faecal matter past these obstructions.

(b) In healthy persons the transverse colon may be quite as low as in visceroptosis, so that the mere position of the colon in an X-ray photograph cannot be taken as an indication of stasis.

(c) Jackson's membrane does not interfere with the movements of the caecum, but is most developed in cases of extreme mobility of that organ (According to Lane, membrane formation leads to anchoring of the gut and consequent stasis).

(d)/

(d) Gastric and duodenal ulcers are much more common in men, while visceroptosis has its greatest frequency in women.

(e) The membranes described by Lane have been occasionally found in the six months' foetus and frequently at birth.

(f) Adami has shown that tuberculosis is seldom or never dependent upon intestinal stasis.

(3) That the membranes and bands are of congenital origin.

That this view is gaining ground to the exclusion of the two preceding is largely the result of the anatomical researches of Flint and Eastman on the new-born child and foetus. Flint and Morley believe that the primary condition is a congenitally long mesentery, the adhesions being an attempt on the part of nature to rectify the consequent tendency to ptosis. According to them Jackson's membrane is an exception to this, being simply a prolongation of the right edge of the greater omentum. Coffey holds a very similar view, and, in opposition to Sir Arbuthnot Lane, lays particular stress in his publications on the theory that the intestinal stasis is the result and not the cause of the downward displacement.

Eisendrath and Schnoor refer to Jackson's membrane as a reduplication of a foetal fold. They describe two/

two types of membrane, one giving rise to kinking and another to symptoms without indicating how they are to be differentiated. Mayo holds that Jackson's membrane is a portion of detached peritoneum from the posterior abdominal wall, the result of an unexplained burrowing in a lateral direction of the lower ileum and caecum.

Anderson and Gray have studied the normal development of the peritoneal sac and endeavour to explain the membranes in accordance with excessive tissue formation at various embryonic sites of fusion. According to others the genito-mesenteric fold of Reid may persist in the adhesion which gives rise to Lane's ileal kink.

The diversity of the views enunciated above is clear evidence of the unusual interest visceroptosis has aroused. Two factors are universally recognised - the ptosis and the membrane and band formation; it is with regard to their causation, development, and relative importance that authorities are still at variance.

Summarizing, the view that the membranes are dependent upon chronic inflammatory changes can be ruled out of account entirely, and one has only to consider the relative claims of the Lane school and the school which supports the theory of congenital membrane and band formation. While the former

believes/

believes that the ptosis is the primary condition and the membranes secondary, the latter, as represented by Flint, Gray, Anderson, and Pringle, is of opinion that the opposite is the case. The mass of evidence as I have indicated supports the latter view, for Lane's bands have been demonstrated in foetal life before any question of ptosis can have arisen.

This of course is not dogmatizing that the ptosis is actually a result of the membrane formation although this has been propounded by various authorities. Thus Eisendrath lays stress on a type of membrane causing kinking and obstruction, while Gray believes that every now and again membranes are so attached as to impede the normal passage of contents along the bowel. In each case visceroptosis will follow on the faecal accumulation.

Walton's conclusion that the ptosis and membrane formation are in no way dependent upon each other is both rational and convincing. He writes that the membranes on the outer side of the pelvic meso-colon are so common as to be regarded as almost the normal condition, while all other membranes are simply slight variations of normal development, their presence frequently being only discovered at an autopsy following death from some entirely different condition. Walton, moreover, heartily supports the views on the etiology/

etiology of the two types of visceroptosis - the virginal and the maternal - which have already received full consideration in this section. To his mind membrane formation and ptosis are two entirely independent factors.

To explain symptoms, Glénard enunciated the theory that overfilling of the splanchnic vessels in consequence of ptosis and kinking accounts for the feelings of nervousness, faintness, palpitations, and general exhaustion. This hypothesis, however, leaves out of account altogether the various adhesions and membranes, and is consequently an incomplete statement of what occurs intra-abdominally.

Lane's views, moreover, on intestinal stasis do not quite meet the case, and to many they are quite inaccurate in so far as they touch upon membrane and band formation. The following modification seems justifiable and necessary:- It has been observed that the more marked the ptosis the less likely are symptoms to be present. If, however, as a result of the presence of membranes, the tendency to downward displacement is resisted, kinking will occur at various sites of election, and this will be associated with dyspepsia, constipation, and auto-intoxication. This combination of congenital membrane formation with visceroptosis, virginal or maternal, developed at/

at a later date, is, I take it, the explanation of symptoms.

W.B. Stoddart, Lecturer on Mental Diseases at St Thomas's Hospital, in an article in the "Lancet" a few months ago introduces another interesting theory suggested by his observation that gastrectasis and visceroptosis are exceedingly common among neurotic patients. He states that Cannon has demonstrated that excitement, chronic fear, or dread leads to increase in the function of the suprarenal glands. It is well known that adrenalin is a stimulant to the sympathetic system, and consequently inhibits peristalsis of the stomach and intestines while contracting the pylorus. This leads to gastric dilatation with the symptoms of one or other form of dyspepsia, and later of gastroptosis. The transverse colon is dragged down with the stomach and in turn pulls upon the ascending colon and kidney, caecum mobile occurring in extreme cases, while sooner or later one will be able to demonstrate all the kinks described by Arbuthnot Lane.

I have previously stated that Sir Arthur Keith's sphincters correspond roughly to the sites of Lane's kinks. Is it not possible, as Stoddart suggests, that adrenalin closes these sphincters in much the same way as it does the pylorus, with consequent obstruction

and/

and ultimate kinking? This theory, so far as it goes, certainly seems a likely one in selected cases, but has the disadvantage of not being universally applicable.

SYMPTOMS AND OTHER CLINICAL MANIFESTATIONS.

Many cases of visceroptosis are symptomless, and in them the condition is of little importance.

When symptoms do occur they may be (1) local in character and referred to one or other part of the abdomen, often simulating organic disease; (2) general, and dependent upon toxic absorption from the alimentary tract, and to some extent also on neurasthenia. The majority of cases in which symptoms occur exhibit both varieties.

Gastroptosis may be present without any symptoms whatever, or these may be mild or extremely severe. Patients complain of a sense of weight in the abdomen, sometimes of nausea and actual pain. The discomfort is almost always aggravated by the taking of food, and is relieved by lying down but not by vomiting. All degrees of pain occur, and sometimes the suffering suggests a diagnosis of acute or chronic gastric or duodenal ulcer.

Vomiting occasionally occurs and may be frequent during exacerbations of the pain. Sometimes there is/

is actual haematemesis although the quantity of blood lost is as a rule small. Constipation is always present, usually marked and obstinate, though it may be replaced temporarily by a diarrhoea set up by intestinal catarrh or mucous colitis. The appetite varies, being poor in some cases, in others quite good. Some patients present features of hyperchlorhydria, and in these the gastric acidity as shown by a test-meal may actually be raised. The majority, however, suffer from flatulence or discomfort after eating, and give chemical proof of a hypochlorhydria, or more rarely of an achylia. In this latter group of cases if the patient is up in years and the appetite is progressively and steadily lost, one very naturally thinks of gastric carcinoma.

The stomach symptoms, apart from one's conclusions towards the end of last section regarding general symptomatology, are determined in their character by impaired motility or disordered secretion, or both. Digestion, although ultimately complete, is very much delayed; there is a stasis and retention of the gastric contents following on atony of the muscular wall. Secretion is increased or diminished, rarely normal. The result from the test-meal may show no evidence of fermentation, and the gas which is eructated may be perfectly odourless.

In/

In these cases of gastroptosis, moreover, one may get pains in the region of the liver and gall-bladder. This is a rare occurrence, and is most frequently observed about the age of forty-five. Such cases have often a close resemblance to chole-lithiasis. Flatulence, discomfort, and a dull gnawing pain radiating towards the back, sometimes of a tearing nature, and associated with local tender-ness are present almost constantly, but in addition one sometimes gets attacks of really acute pain suggestive of typical gall-stone colic, the clinical picture becoming all the more confusing if jaundice is superadded. It is difficult to guage just how much of these gall-bladder symptoms is reflex from the prolapsed stomach and caecum, or is dependent upon a mobile kidney or a ptosed liver, especially one presenting a well-marked Riedel's lobe. It must never be forgotten, however, that there may be coin-cident gall-stones, a descent of the duodenum leading possibly to interference with the passage of bile and facilitating the ascent of infective micro-organisms along the bile-ducts.

The engorgement of the mucosa of the pylorus or first part of the duodenum may lead to the formation of an ulcer at the sites of kinking (Lane). I do not/

not propose to discuss the symptoms of gastric and duodenal ulcer, nor shall I do more than mention the complications of haemorrhage and perforation, and the possible sequela of gastric carcinoma.

Nor can I go into the symptomatology of (1) cardiospasm, or spasm of the cardiac orifice of the stomach, (2) gall-stones from infection of the biliary passages, (3) acute or chronic disease of the liver, and (4) pancreatic infection, with the various types of lesion that may occur such as inflammation, chronic induration, cancer, and degeneration of the islets of Langerhans with consequent diabetes.

Movable <u>spleen</u> is by no means common, being found in no more than two per cent of cases of general visceroptosis. Like movable kidney it may be found accidentally in people who have no symptoms whatever. Sometimes it gives rise to dragging pains in the side, while very rarely one may get severe manifestations akin to Dietl's Crises, due to torsion of the pedicle. In these there is acute abdominal pain, high fever, and great swelling of the organ ending possibly in necrosis.

Then in visceroptosis the local pain and discomfort may centre in the <u>kidneys</u>, especially the right,/

right, by virtue, as explained already, of the extensive movement of the liver with respiration on that side. Nephroptosis occurs in fifteen per cent of all women, eight per cent of these cases being absolutely symptomless and discovered only by accident. When symptoms occur they may be either slight or severe, lumbar pain and dragging discomfort, or more rarely intercostal neuralgia being the most frequent. The feeling of traction on the homolateral side is often lessened in the recumbent posture, and increased on standing or walking. Dilatation of the stomach and gastric symptoms which frequently occur may be ascribed to drag upon the duodenum or to a reflex spasm of the pylorus; jaundice and possibly gall-stones to pull upon the bile-ducts; and constipation to interference with the colon or actual coloptosis. One observer actually endeavours to associate chronic appendicitis with congestion due to pressure of the superior mesenteric vein against the pancreas.

Further, movable kidney frequently gives rise to severe attacks of pain identical with or simulating renal colic. These were first described by Dietl in 1864, and explained by kinking or torsion of the renal vessels or of the ureter. In these so-called Dietl's crises one gets in addition to acute pain such/

such symptoms as nausea and vomiting, chills, fever, and even collapse. The urine is scanty and contains an excess of urates and oxalates; sometimes there is haematuria. The affected kidney is tender, probably from a kinking of its vessels, but this is not associated with a tumour unless intermittent hydronephrosis occurs from pressure upon the ureter and dilatation of the pelvis. With the advent of this complication a swelling appears first of all anteriorly, and extends rapidly so as to involve the whole kidney region. It disappears after a few days with the discharge of abundant clear urine, only to recur again in all probability in from one to three months. Septic infection may supervene, giving rise to pyelitis, pyelonephritis, or pyonephrosis.

The main difficulty in all cases of nephroptosis is to guage just how much of the symptoms is dependent upon the kidney lesion.

When the local symptoms of visceroptosis are situated in the lower part of the abdomen, the blameworthy lesion is frequently '<u>caecum mobile</u>'. As the name implies it is usually freely movable and often prolapsed over the pelvic brim, while <u>Jackson's membrane</u> is well-developed and may have kinked either the ascending colon or appendix. With these conditions symptoms may be entirely absent, but severe constipation/

constipation is the rule, associated with periodic pain over the caecum and ascending colon which are tender on pressure. This pain, often colicky in character, is usually intensified in from four to five hours after a meal; at other times it may only be brought out by deep palpation. Mucus may be found in the stools from the development of a colitis, when sooner or later constipation will temporarily give way to diarrhoea.

Caecum mobile is associated with splashing and gurgling in the right iliac fossa, and with evidence of distention from local meteorism.

Walton's analysis of this group of cases shows that the majority resemble chronic appendicitis, the minority acute. In the former, flatulent dyspepsia is a constant occurrence, is usually worse after exercise, and is relieved by lying down. Pain comes on in exacerbations at relatively short intervals of days and weeks. Vomiting is of a particularly intractable nature, and gives little relief to the pain. Pyrexia never occurs.

In the latter, the pain which may at first be acute eventually settles down in the region of McBurney's point, but is never so agonizing as in appendicitis. Vomiting and slight pyrexia are relatively infrequent. Several such attacks may occur, and/

and although the appendix may be acutely inflamed and tacked down by adhesions, its removal will only ensure temporary relief.

Pericolic membranes in general accentuate the symptoms of enteroptosis as they tend by their contraction to interfere with the normal peristalsis and anti-peristalsis of the bowel.

The symptomatology of uterine retroversion and prolapse need not detain us here. These conditions often lead to infections of the genito-urinary tract as nephritis, pyelitis, cystitis, ovaritis, salpingitis and endometritis with such symptoms as pain and tenderness, bladder irritability with frequency of micturition, disordered menstruation, etc.

The clinical manifestations which arise from cardioptosis, arterio-sclerosis, and comparative fixation of the diaphragm will come up for discussion later.

All the symptoms referred to above are more or less dependent directly upon the visceroptosis, but in severe cases the associated faecal accumulation is in itself sufficient to cause many local lesions such as enteritis, intestinal obstruction, ulceration of the colon, and haemorrhoids. In women the pressure may lead to dysmenorrhoea apart altogether from any question/

question of uterine displacement; in men nocturnal emissions occur with undue frequency. Constipation has also been blamed for volvulus and for the extreme dilatation of the intestines known as Hirschsprung's disease, while one or two cases have been recorded of rupture of the diseased gut occurring when the patient is straining at stool.

Pain may result from irregular peristalsis or pressure upon nerves, common sites being at the back of the thigh or hip joint from pressure of an over-loaded sigmoid upon sacral nerves, and down the front of the left thigh from pressure on the femoral nerve.

Faecal accumulation and flatus explain to a certain extent the presence of abdominal distention. Large scybalous masses may be palpable especially along the descending colon or at the splenic flexure, rarely at the caecum; the rectum is usually loaded, but may be ballooned and empty.

The evacuations are infrequent, insufficient, hard, and possibly scybalous. They often contain a variable amount of mucus, and are accompanied by much straining. In cases with prolonged retention, diarrhoea may set in, and may be present for days, before its real cause, constipation, is discovered. Sometimes the motions which are then passed are large, but/

but in rare instances they are extremely small, the faecal masses being channelled, and diarrhoea occurring through the canals.

In addition to these local symptoms, in the vast majority of cases there are also general symptoms due to intestinal stasis and neurasthenia. While the general health is often fair with constipation, as a rule all functions are more or less depressed from toxic absorption from the unhealthy bowel. The complexion becomes muddy, and frequently oily and pimply especially in young subjects; the conjunctivae are stained, a slight icteric tint being not uncommon. In long-continued cases the patient sweats easily and his perspiration is offensive; there is alteration in the colour and texture of the skin with the laying down of pigment in sites where it is normally present or where there is friction or other irritation. A type of Raynaud's disease ("microbic cyanosis") has also been described in which the extremities are anaesthetic and bluish. The hair becomes dry and prematurely grey, although it may grow excessively in places where it is normally absent, especially in women. Thus certain feminine "freaks" have been at times acclaimed by enthusiastic supporters of the 'Kink theory' as illustrations of the dire results of/

of intestinal stasis.

Auto-intoxication, moreover, may cause loss of fat, subnormal temperature, and wasting of general musculature, voluntary and involuntary.

A varying degree of anaemia is a constant feature, and consequently one gets symptoms referable to disturbances from insufficient blood-supply of every organ and system in the body. Thus in the nervous system, dependent upon anaemia and toxaemia, one gets fatigue on slight physical or mental exertion, one of the first features being a tendency to sleepiness by day, and wakefulness and irritability by night. Headaches are frequent and severe, and nervousness and hysteria common, whilst again there may be neurasthenia, loss of control of temper, and mental depression leading even to melancholia and crime.

Sensory and vasomotor disturbances are often present. Pains of a neuralgic or rheumatic character may focus in the coccyx, breast, or cardiac region, although one may get almost any form of paraesthesia, hyperaesthesia, or anaesthesia. "Sensitive spots" are referred to in the literature.

Symptoms referable to the cardio-vascular system are breathlessness, especially on exertion, palpitation or anginatous attacks, giddiness, and a tendency to syncope. The breathlessness is of course to some extent due to the low position of the diaphragm, and possibly/

possibly to gastro-intestinal distention. Paroxysmal tachycardia and other cardiac irregularities have been described, while the lowered general resistance predisposes to ulcerative endocarditis.

Lastly, the anaemia is in part responsible for the digestive and pelvic disturbances.

Another occasional clinical manifestation of faecal accumulation is pyrexia, which is especially liable to occur after the administration of aperients.

In the urinary system one may get symptoms due to such gross conditions as nephritis, pyelitis, pyelonephritis, and pyonephrosis, but in addition there may be directly dependent upon haematogenous infection and toxic absorption, the state of bacilluria, in which the urine is cloudy from large numbers of B.Coli; this infection is quite often symptomless. Moreover, indicanuria sometimes occurs, and is a result of faulty metabolism and improper diet.

The breasts may be the seat of an early and chronic inflammation, sometimes with cyst formation (Lane's 'cystic breast'), most marked in the upper and outer zone. In untreated cases cancer may develop on top of the old degenerative changes.

Further, certain eye conditions, especially iritis and retinitis, have been ascribed to the lowered/

lowered resisting power of the tissues, while Lane holds that without stasis patients will seldom be infected with tuberculosis and rheumatoid arthritis. The evidence of this is far from sufficient, and few surgeons have the courage or conviction to treat the bowel condition rather than the local lesion. Rheumatic fever and pyorrhoea alveolaris have been emphasised by certain authors as common sequelae of an unhealthy bowel.

Lastly, changes in the thyroid, usually wasting, are in part responsible for elevation or lowering of the blood pressure.

From the perfect maze of facts cited above, it is clear that there is a grain of truth in these words of Leonard Williams:- "It is no exaggeration to say that chronic constipation is at least a contributory cause in all chronic disease. At the back of the microbe, there is to be sought the cause of the microbe, and this cause in every case is the state of the soil which permits him to flourish. Such a state of soil is described as a chronic auto-intoxication, which is only another way of saying that the drainage system is defective..... There are many diseases about which long articles and even large volumes have been written - pyorrhoea alveolaris and rheumatoid arthritis, for example - and many dyscrasies - the gouty,/

gouty, the glandular, the acid, and the migrainous to wit - which are no more than symptoms of chronic intestinal stasis. The percolations from the cesspool have permeated the soil, and the whole carcase becomes inhabited by the fauna and flora of decomposition and disease. The particular members of these hostile groups which are destined to lead the invasion, and the particular points selected for their ultimate development are decided by considerations which are at present beyond us."

Ordinary methods of physical examination need not be discussed in this thesis, but a few paragraphs must be devoted to the investigation of cases by radiography and the barium meal.

Screening the abdomen is of infinitely more value than photography. The stomach normally commences to empty at once, while the meal reaches the caecum in four-and-a-half hours, the hepatic flexure in six, the splenic flexure in eighteen, and the rectum in twenty-four.

Information is obtained regarding the size, form, shape, and position of the stomach, and the presence of tumours, ulcers, and other deformities in the outline of the organ such as "hour-glass" constriction. One can estimate the vigour and regularity of peristalsis/

peristalsis and the presence or otherwise of spasm. The size, motility, and degree of displacement of the intestine, possibly also the existence of tumours, ulcers, or catarrh all come up for consideration.

Tumours may cause irregularity of shadow, while ulcers often show as projections. Peristalsis is usually extremely active with ulcer or stenosis, while the so-called 'duodenal cap' may be deformed or absent in marked atony, tumour, pyloric stenosis, or duodenal ulcer. Indentations may be due to peristalsis, and if only seen in a single photograph should not be accepted as evidence of organic stenosis or hour-glass contraction. With the screen, kneading of the abdomen should be resorted to in order to differentiate between a functional and temporary spasm and an organic lesion.

The patient should be examined immediately after the barium meal and after intervals of six, twelve, twenty-four, and occasionally forty-eight and seventy-two hours. It is also sometimes useful to administer a bismuth enema for determining the degree and location of adhesions and the mobility of the intestine. Healy's special method can be employed which consists in placing the patient for five minutes after the injection in the knee-chest position, and in screening him later in the Trendelenburg.

Although/

Although considerable information can be obtained and a definite diagnosis made without the aid of radiography, with it one gets an excellent idea of the existing lesions and can venture an exact prognosis. The patient, moreover, is impressed with the correctness of one's diagnosis and is more likely to undergo a full course of treatment.

In mild grades of gastroptosis there is often but slight delay in the opening of the pyloric sphincter, and this is frequently accompanied by ptosis and sharp angulation at the hepatic flexure without evidence, however, of adhesions. In severe cases barium may be demonstrated in the stomach after the lapse of days.

In early cases of intestinal stasis there may be no radiographic evidence, or at most a varying degree of slowness in the passage of the meal along the ileum, caecum, and ascending colon. Sometimes, however, there is displacement and tipping over of the caecum, and ptosis and narrowing from angulation or adhesions at the hepatic flexure. A "double barrel gun" formation in which the ascending colon and the first part of the transverse take part has been described in some instances on the administration of an opaque enema; as the colon distends the two portions of gut are gradually drawn together. This phenomenon is perhaps most easily observed by first of all X-raying the/

the patient in the erect position after the injection. Healy's method is then employed, when, if Jackson's membrane is present, the double barrel gun appears in the knee-chest position and persists in the Trendelenburg X-ray, whereas, in the absence of adhesions, the transverse colon will be seen to have moved upwards in the final photograph and to swing freely at the hepatic flexure.

Other pericolic bands and membranes can also be demonstrated by radiographic methods.

BACTERIOLOGICAL CONSIDERATIONS.

THE INTESTINAL FLORA.

The bacteriology of the alimentary tract has been studied within recent years by Drs White Robertson, Nathan Mutch, and Chalmers Watson. The last-named worker has prepared films either direct from the stools or from the results of two intestinal wash-outs, two-and-a-half to three pints of plain water being used on each occasion. The number of organisms obtained especially from the second wash-out in the healthy individual and in disease has roughly been compared, the count being strikingly less in the former, but diminishing steadily in the latter under treatment with/

with colon lavage and intestinal antiseptics. The same observer has recently introduced a saccharose-milk-agar medium on which Gram-positive organisms and yeasts grow most readily, as many as eight per cent of the bacteria obtained on using it for primary culture being Gram-positive as against five per cent on ordinary agar. This result indicates the necessity for the revision of the commonly accepted view that a large proportion of the organisms usually present in the faeces is incapable of being grown and is therefore dead. Moreover, it is clear that much work still remains to be done with regard to the relationship of the intestinal flora to the common chronic diseases met with in medical practice.

Graham Brown has studied para-hydroxy-phenyl-ethylamine, one of the toxins which are believed to be absorbed from the intestine and excreted in the urine in chronic ileal stasis. He finds that it has a pressor effect upon the sympathetic neurones, and consequently increases the pulse-rate and blood-pressure. The secretion of gastric juice is diminished, while X-ray examination reveals atony of the stomach wall, some tonicity of the sphincters, and delay in the passage of barium throughout the gastro-intestinal tract. Part of the action of this amine, the writer holds, is through the ductless glands, in particular/

particular the thyroid and suprarenals. This is interesting in view of the more recent observations of W.B. Stoddard and Cannon which have already been discussed in the section on pathogenesis.

P R O G N O S I S.

So many factors are involved that space will only permit of a very general statement.

Visceroptosis is never fatal, but the time an individual case is likely to take to recover is most uncertain. The lives of these patients are often extremely miserable, but much can be done if the physician can but gain the necessary confidence and carry out a course of judicious therapy.

MEDICAL TREATMENT.

The membranes in visceroptosis are congenital and obviously of secondary importance in the production of symptoms. The rational line of treatment is to endeavour to prevent the ptosis and the intestinal stasis, the best results naturally being obtained in the maternal type.

Exercises designed to develop the general musculature,/

musculature, and the abdominal muscles in particular, are of great importance. Walking in itself is helpful, but exercises in the gymnasium are better, cold baths, swimming, lawn tennis, golf, cricket, bicycling, shooting, and hunting have all been recommended, but care must be taken that activity is suitably alternated with rest so that the muscle fibres will not be overtaxed. For this end, also, the subject should be warned against the lifting of heavy weights, and if a child, should have its work intelligently regulated. Compression around the waist must be avoided as improperly made corsets, tight lacing, and waist-bands frequently encourage the viscera in their fatal descent into the pelvis.

A tendency to emaciation must be counteracted by good feeding. Patients moreover should not be allowed up too soon after confinements and debilitating illnesses; prophylaxis in the former case is easy if the patient will only remain in bed for the first ten days and wear a suitable abdominal binder.

To prevent constipation regularity of habits is important. A daily morning stool should be aimed at, a short rest after breakfast allowing the stimulus to develop. The use of low lavatory seats, exercise, hydrotherapy, and a good mixed diet containing residue are all useful adjuncts; so is a glass of water first thing/

thing in the morning and last thing at night, possibly also half an hour before all meals.

Once visceroptosis has developed the following general principles of treatment should be applied:-

(1) The abdominal muscles require support and strengthening so that the intra-abdominal pressure may be increased.

(2) One must endeavour to correct the dyspepsia, keeping in mind that much of it is purely nervous in origin.

(3) Special attention must be directed to overcoming constipation.

(4) Treatment of neurasthenic symptoms, which are so apt to interfere with the patient's collaboration with other methods, is requisite.

(1) Mechanical support of the organs.

In mild cases a well-fitting abdominal bandage made preferably of linen will be sufficient to relieve the patient's symptoms, it being an advantage to attach straps to secure it in position and to prevent it from riding up over the hips. In other cases adhesive plaster strapping will be requisite, the physician applying a width of five to seven inches in all, extending from the iliac fossa and loin on one/

one side right across the abdomen and over the spine posteriorly. As a rule two straps are required on each side. They should never be kept on for more than three to five weeks, the patient in the twelve to twenty-four hours' intermission taking a full bath and wearing an abdominal pad sprinkled freely with talcum.

Douglas Stewart of New York employs such strappings for preventive as well as curative purposes, and by reinforcing it with side straps of soft rubber gets excellent results in the puerperium. One advantage claimed is that the patient is enabled to sit up in bed at an early date without risk of displacements.

Other types of adhesive plaster belts have been employed in the treatment of visceroptosis. In all, pressure is exerted on the area below the umbilicus so that the intestines are forced up directly and the stomach and kidneys secondarily through the increase of intra-abdominal pressure. All such appliances require to be most carefully fitted with the patient in the recumbent posture.

In some cases a combination of the two above methods of abdominal support is the best line of treatment. Thus adhesive plaster strapping may be utilized/

utilized for the first two or three months, followed by linen or silk abdominal bandages.

A great many of the corsets on the markst are ineffective, and encourage rather than correct the ptosis. The Gallant and La Grecque varieties have been much advocated, especially in America, while the Curtis belt, made by Messrs Walton and Curtis of 8 Old Cavendish Street, London, is the contrivance designed and specially recommended by Sir Arbuthnot Lane himself.

Hurst believes that the good results obtained by the use of these supports are due to the general increase of intra-abdominal pressure, and therefore deprecates the use of pads for special organs as unscientific. These supports, he holds, should be worn early in all cases, and not merely when the abdominal muscles are so flabby that they are likely to remain so. Once the viscera are supported the patient's digestion is aided and his appetite improves; he is encouraged to take more exercise, thereby promoting intestinal peristalsis and overcoming ileal stasis. It is well to note, however, that in the later stages of visceroptosis the membranes and bands may have undergone secondary shortening so that all methods of support will be ineffectual.

A belt with a pad over the kidney region, which is/

is applied when the kidney has been replaced, has been found of some benefit in nephroptosis.

Remedial gymnastics and massage are of value in strengthening the abdominal muscles. Careful regulation of exercise, however, is required especially in thin subjects, as if at all excessive these measures will defeat their purpose and prevent any increase of body weight. The majority of the movements employed are flexion, extension, and rotation of the trunk, and elevation of the legs, usually against resistance, benefit accruing from improvement in the lumbar curve and widening of the lower thorax or, in other words, from correction of the bad body habit and imperfect muscular development. Many of the exercises should be performed in the recumbent or semi-recumbent posture so that the force of gravity may be utilized to aid the replacement of the viscera. Moderate walks and driving are helpful where more vigorous methods are contra-indicated.

Mild local or general massage either daily or at least three or four times a week improves the muscle tone, some authorities advocating the rolling of a cannon-ball over the abdomen for five minutes night and morning. Vibratory massage with a good brush can also be employed, and does not necessitate the removal of the abdominal bandage or belt.

Intragastric/

Intragastric faradisation has been attempted, but makes the symptoms worse.

In severe cases absolute rest in bed, abdominal strapping, massage, and good feeding may be necessary, whereas in milder ones, or when the patient is recovering, short periods of rest between the exercises are often all that is required. Here one may note that at no time during the rest treatment is elevation of the foot of the bed necessary when the patient is wearing an abdominal support.

(2) The correction of the nervous dyspepsia.

Russ has recommended institutional treatment for all cases, but this is impracticable in view of the enormous numbers of patients and the length of time they would require to remain in the wards; a sufficiency of physical and mental rest is, however, of prime importance. Dieting will require attention, treatment being directed to the counteraction of the particular chemical abnormality which is present in each individual case. If there is hyperchlorhydria the diet should consist mainly of protein to take up any excess of hydrochloric acid that may have already been poured out, and to inhibit any further secretion. Meals should be frequent and may contain abundance of fats, while such things as alcohol, pepper, mustard, and/

and excessive salt are prejudicial and should be avoided.

In hyperchlorhydria on the other hand an article of diet of high protein content, such as mulk, should not be prescribed as it leads to still further slowing of the digestive processes. Farinaceous foods may be given in moderation, while sauces and condiments and a little whiskey and brandy are all beneficial. Too much fluid at any one time must be avoided as it dilutes still further the hydrochloric acid.

The teeth require attention in every case of dyspepsia, as if deficient and decayed thorough mastication of the food is impossible. Twenty minutes rest after each meal is a useful aid to digestion, which in these days of hurry and bustle is sadly neglected.

Many patients improve on a semi-vegetarian diet. Others, and especially those who are poverty-stricken and underfed, do well under John Russell's method of fattening as employed in the treatment of pulmonary tuberculosis. This includes such articles as raw eggs, cream, and koumiss, buttermilk, and large amounts of butter. The raw eggs may be given beaten up with milk, starting with one or two daily and increasing to eight or ten. In view of the constipating effect of this diet particular attention should be paid to

the/

the bowels.

With regard to drugs, general tonics are all beneficial, such as iron and arsenic in pill form, and strychnine by the mouth if there is no hyperchlorhydria, otherwise hypodermically. Hyperacidity will require alkalies and belladonna, hypoacidity hydrochloric acid, pepsin, nux vomica, gentian, and other stomachics.

(3) Treatment of intestinal stasis.

Patients should get into the habit of going to stool at a fixed hour every day, preferably after breakfast. Exercise in moderation is helpful; so are massage and electricity, baths, and hydrotherapy. The function of the stomach should be studied, and the diet modified accordingly, foodstuffs of special benefit in otherwise uncomplicated cases being porridge, wholemeal bread, apples, oranges, figs and prunes, and vegetables. Of liquids water may be partaken of freely, a tumblerful of hot or cold water taken slowly on rising being efficacious in most cases; in others Vichy or Carlsbad "aperient waters" may have to be substituted.

Efficient and harmless over long periods are soap and water and small glycerine enemata. Soap, however, in exceptional cases acts as an irritant and causes/

causes spasm, making the constipation worse; plain water or water and salt (one teaspoonful to the pint) never has this effect, high colonic douches of tepid water over long periods affording much relief in the average case, and being therefore specially recommended by the profession. In severe cases one may have to inject a pint of olive oil at night, followed next morning by soap and water.

Numerous drugs are in vogue, and one has to try the effect of one after another until the patient is suited, cascara sagrada, belladonna, aloes, nux vomica, and liquid paraffin being all of special service. The more powerful cathartics may be distinctly harmful, although saline aperients are often definitely useful. Efforts should be made, however, to obviate the use of drugs as far as possible by attention to general hygienic measures.

The employment of intestinal disinfectants may conveniently be considered in this sub-section. To be of any use they must be given over long periods, say, of from four to six weeks. Thymol is one of the best and should be given in ten grain doses in powder or capsule twice or thrice daily. Calomel in doses of one-sixth of a grain three times a day has quite a definite disinfectant action, whereas salol, bismuth salicylate, beta-naphthol, and quinine, which have all had their advocates, are on the whole disappointing.

(4)/

(4) Treatment of the neurasthenia.

If the subject has developed neurasthenic symptoms, the physician may have difficulty in securing his collaboration with the above measures. The medical attendant should have before his mind two main principles, the first to endeavour to remove the cause of the neurosis, the second to rest and restore the nervous system. No hard and fast rule for treatment can be laid down, every case being judged upon its own merits in accordance with the patient's general character and physical and social status. While psychic treatment, hydrotherapy, and the removal of sources of peripheral irritation have all their value, one may have to resort to the so-called 'rest cure' or Weir-Mitchell treatment before any lasting benefit will accrue. The principles of this course are as follows:- (1) Rest in bed away from home and friends for at least six weeks.
(2) Abundant feeding with milk and other easily assimilable foods. (3) Massage, which enables the patient to partake of and digest more food. The results are often excellent, weight increasing, sleep returning, and the nervous system calming.

Treatment by drugs is as a rule unnecessary, but general tonics are of some subsidiary value. Alcohol, morphia, and chloral hydrate should never be given as they/

they are liable to produce a drug habit, but an occasional dose of aspirin, bromide, or some other sedative will take the patient over an emergency. It is for the insomnia that these substances are most frequently required, but a hot drink or a little food, with an occasional wet pack, will often suffice, and should always be tried in the first instance.

Intercurrent conditions in visceroptosis will require symptomatic treatment. Thus Dietl's crises will necessitate the application of heat to the kidney, fluid diet, elevation of the foot of the bed, an attempt at replacement, and the administration of codeine or morphia.

The last and one of the most important points in this medical survey is that the physician must be careful not to lay too much stress on the nature of the disorder, for symptoms very often date from the time the patient is informed that a certain displacement is present. Thus if a movable kidney is discovered accidentally in the course of a routine abdominal examination, it is well not to mention its existence.

SURGICAL TREATMENT.

In a certain percentage of cases medical therapy fails and surgical interference may be called for. One word of warning is necessary with regard to all surgical procedure. The mental condition of the patients is usually such that they are only too ready to submit to operation until, as Dr W.J. Mayo says, "they have had all the movable organs fixed and all the removable ones removed." Still some degree of benefit occasionally results, although too often the operator's lot is naught but discredit and failure.

As this thesis is intended to be a medical one, a detailed discussion of the various operations which have from time to time been advocated is unnecessary.

Surgical measures include (1) division of constricting bands, (2) fixation of the viscera, (3) attempts to refashion the abdominal cavity, and (4) operations primarily to overcome stasis and the various lesions described by Arbuthnot Lane as directly dependent upon it. This group includes ileocolostomy, colectomy, appendicectomy, gastrojejunostomy, appendicostomy, and plication of the viscera - all operations which have proved useful in select cases.

(1)/

(1) Only in exceptional cases is the division of the membranes and bands to be advised. In considering the pros and cons of this operation it must be remembered that after division the ptosis will still be present, and that general orthopaedic measures must be continued for at least six months. The Knife can only be justified after all medical measures have absolutely failed, and when there is still a definite possibility that recovery is possible from the secondary intestinal atony. Further, the surgeon must remember the tendency of the adhesions to recur, and the interesting view of Sir Arbuthnot Lane that their presence in the first place is purely compensatory.

From a consideration of all the above, it seems surprising that the operation has been attempted at all, but good results nevertheless have been reported, especially in cases in which a course of massage and exercises has been resorted to immediately after the abdominal wound has healed.

(2) Fixation of the viscera is frequently performed, Walton recommending it for these cases in which the ptosis is marked and practically localized, and the symptoms are referred solely to the affected organ. Others, again, advise a combination of division of the membranes and gastropexy, caecopexy, hepatopexy or even/

even nephropexy.

Wilms believes that atony and dilatation of the caecum are of prime importance, and recommends fixation of that organ. Nephropexy, however, is probably the most frequently employed of all this class of operations, so much so that one might profitably append the indications for its use, viz:- (a) Where symptoms are severe and unrelieved by rest and abdominal belts; (b) when renal crises are frequent; and (c) where pyelonephritis or hydronephrosis have occurred.* Hey Groves summarizes his results as follows:- One to two per cent of all cases operated upon die; ninety per cent are relieved of their pain; fifty per cent are cured of gastro-intestinal disturbances.

(3) Operations for refashioning the abdominal cavity are without exception futile, as the capacity of the lower thorax and upper abdomen does not increase after the requisite surgical measures. Moreover, ventral hernia is liable to occur in the wound from the continuous action of the greatly increased intra-abdominal pressure.

(4) With the primary object of attacking the intestinal/

* Nephrectomy may be required when the kidney is thoroughly disorganized by hydronephrosis or other disease.

intestinal stasis, Arbuthnot Lane prefers to short circuit the lower end of the ileum to the upper part of the pelvic colon (ileocolostomy), this operation being specially useful in fat patients with short mesenteries and many adhesions. Not only has this operation been found of value in cases of visceroptosis with local symptoms, but also in those general conditions which Lane holds are dependent upon toxic absorption. In other cases this same authority prefers colectomy, the immediate risk from which he claims is very much less by virtue of the reduction of the intra-abdominal tension from the removal of the large intestine. Where the gut is well held up by numerous adhesions this operation is certainly preferable, though other surgeons of repute have not had anything like so good results as its original advocate.

Crile and Mothersole only remove the caecum, ascending colon, and first part of the transverse, but their statistics of improvement have likewise been indifferent. Stiles of Edinburgh is also a supporter of partial colectomy for those cases in which other measures are unlikely to succeed.

Of the other operations which are sometimes performed to remedy the bowel condition and the various secondary lesions which are attributed to it, appendicectomy/

appendicectomy and gastrojejunostomy need not be considered as their indications are obvious; it should be remembered, however, that neither is in itself sufficient to clear up the patient's symptoms.

Appendicostomy consists in sewing the stump of the appendix into an opening in the abdominal wall. The colon may be thoroughly washed out through this aperture once or twice daily, a measure which is particularly useful where the presence of diarrhoea and haemorrhage suggests a chronic colitis.

Although plication of the viscera was formerly much advocated in the case of the stomach and caecum, of recent years it has fallen into disrepute.

To sum up, the consensus of opinion with regard to all operative measures is that, except in a very few cases when ileo-colostomy and partial or complete colectomy may be indicated, the best results are obtained from division of the membranes, preceded and followed by purely medical therapy.

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